

CLEAR CONDITIONING DETERGENT COMPOSITIONS AND METHODS  
FOR MAKING THE SAME

This application is a continuation-in-part of  
5 U.S. patent application serial number \_\_\_\_\_ [number  
will be commonly assigned, Attorney Docket No. D-  
3022], filed November 7, 2001, the disclosure of which  
is incorporated in its entirety herein by reference.

10 Background of the Invention

The concept of cleansing and conditioning  
detergent products has drawn great attention since its  
launch in the early 1980's. From a technical point,  
cleansing and conditioning are contradictions, since  
15 conditioning has to deposit some ingredients on an  
object and cleansing has to remove the deposited  
ingredients from the object. To combine cleansing and  
conditioning in detergent products means when the  
product removes the dirt from the object, the product  
20 also simultaneously deposits some conditioning  
ingredients on the object. The conditioning effects  
depend on the equilibrium between the removed dirt,  
conditioning ingredient and deposit conditioning  
ingredients. For hair products, conditioning involves  
25 depositing certain agents onto the hair to give it the  
protection, softness, shine and detangling effects.  
Less deposition means less conditioning and more  
deposition means more conditioning or over  
conditioning.

30 To achieve proper conditioning formulations,  
chemists are faced with the challenge of choosing the  
appropriate conditioning ingredients, the proper ratio  
of conditioning ingredients to surfactants and methods  
of incorporating conditioning ingredients into the  
35 detergent system to form stable products.

A conditioning ingredient should have the basic  
characteristic of being water-insoluble, easy to be  
spread and have some affinities with the application  
objects. Polysiloxane, such as dimethicone, and

derivatives are water-insoluble and are widely used conditioning ingredients. Furthermore, polysiloxanes usually give good hair protection, softening, shine and detangling effects.

5       The various technical methods for incorporating polysiloxanes, such as dimethicone, into the deterative products have been patented. The focus is on the particle size distribution of dimethicone surfactant emulsion and stability of the shampoo. Smaller  
10 particle size means more stability and more deposition to the targeted object.

Although some success has been achieved in being able to incorporate polysiloxanes, such as dimethicones, into deterative compositions, other  
15 challenges still remain. It remains a challenge to be able to formulate a stable conditioning/deterative composition, especially when a polysiloxane (e.g. dimethicone) is employed. Considering the regular viscosity of the deterative composition and the  
20 relatively lightweight of the conditioning ingredients, it is very difficult to achieve a long-term stability of the products. For example, the products tend to separate with the conditioning ingredients settling on top of the water-detergent  
25 solution. Furthermore, it remains a challenge to be able to formulate a clear stable conditioning/deterative composition, especially when the conditioning ingredient is a polysiloxane.

There continues to be a need to have a more  
30 stable formulation having a conditioner and a deterative composition. In particular, there is a need to have a clear deterative formulation which comprises a polysiloxane.

### 35   Summary of the Invention

The present invention meets this need and provides for a stable, clear deterative composition having a polysiloxane component. In one embodiment,

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Further in accordance with the present invention, the composition further comprises a deterative component. For example, the composition comprises about 5% to about 60% of the deterative component,

about 0.01% to about 10% of the emulsifier component, and about 0.01% to about 10% of the polysiloxane component.

Still further in accordance with the present invention, a method of making a clear shampoo is provided. The method comprises the steps of forming a micro-emulsion of a polysiloxane component, and combining the micro-emulsion with a deterative component. The micro-emulsion is formed by combining a non-ionic emulsifier with a polysiloxane component.

Any feature or combination of features described herein are included within the scope of the present invention provided that the features included in any such combination are not mutually inconsistent as will be apparent from the context, this specification, and the knowledge of one of ordinary skill in the art.

Additional advantages and aspects of the present invention are apparent in the following detailed description and claims.

#### Detailed Description of the Invention

The present invention is, in part, based upon the surprising discovery that a polysiloxane component may be combined with a deterative component to form a clear composition, preferably a clear shampoo. In a broad embodiment, the composition comprises an emulsifier component and a polysiloxane component.

Without wishing to limit the invention to any theory or mechanism of operation, it is believed that a clear composition, for example a clear shampoo composition, may be produced by combining a deterative component with a preformed micro emulsions comprising a polysiloxane component. The micro emulsions may or may not remain intact after it is combined with a deterative component.

In one embodiment, a composition of the present invention remains stable (for example remain clear) for about 360 days after manufacturing.

In one embodiment, the micro emulsions are formed by mixing the emulsifier components with the polysiloxane components, preferably in the presence of water. For example, micro emulsions are formed by  
5 homogenizing emulsifier components with polysiloxane components in a tank at about 40 to about 70 degrees C. In one embodiment, a homogenizer employed is model number ME 100 LC by Charles Ross and Son, Hauppauga, NY. In one embodiment, the ratio (by weight) of the  
10 emulsifier component to the polysiloxane component in a micro emulsion is about 1:1, 1:2, 1:3, or 1:4.

In one embodiment, emulsifier components include a non-ionic emulsifier. In another embodiment, the emulsifier components include a non-ionic emulsifier  
15 and at least one of an anionic emulsifier and an amphoteric emulsifier. The anionic amphoteric emulsifiers are selected from the anionic and amphoteric surfactants, respectively.

Non-limiting examples of non-ionic surfactants  
20 include: Capryleth-n, where n=4, 5; Deceth-n, where n=3, 4, 5, 6, 8, 9, 10; Undeceth-n, where n=3, 5, 7, 8, 9, 11; Coceth-n, where n=3, 5, 7, 8, 10; C9-11 Pareth-n, where n= 5, 6, 8; C9-15 Pareth-8; C11-15 Pareth-n, where n=3, 5, 9, 12, 15, 20, 30, 40; C11-21-  
25 Pareth-n, where n=3, 10; C12-1-n, where n=3, 5, 7, 9, 12; C12-14 Pareth-n, where n=5, 7, 9, 12; C12-15 Pareth-n, where n=2, 3, 4, 5, 7, 9, 10, 11, 12; C12-16 Pareth-n, where n=5, 7, 9; C14-15 Pareth-n, where n=4, 7, 8, 11, 12, 13; C20-22 Pareth-30; C20-40 Pareth-n,  
30 where n=3, 10, 24, 40; C22-24 Pareth-33; C30-50 Pareth-n, where n=3, 10, 40; C40-60 Pareth-n, where n=3, 10; C12-14 Sec-Pareth-5; C12-14 Sec-Pareth-n, where n=8, 9, 15, 20, 30, 40, 50; C11-15 Sec-Pareth-12; Dihydrocholeth-n, n=15, 20, 30; Glycereth-n, where  
35 n=7, 12, 20, 26, 31; Hydrogenated Talloweth-n, where

n=12, 25; Isoceteth-n, where n=10, 15, 20, 30; Isodeceth-n, where n=4, 5, 6; Isolaureth-n, where n=3, 6, 10; Isosteareth-n, where n=2, 3, 10, 12, 20, 22, 25, 50; Laneth-n, where n=5, 10, 15, 16, 20, 25, 40, 50, 60, 75; Laureth-n, where n=1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 20, 21, 23, 25, 30, 40, 50; Myreth-n, where n=2, 3, 4, 5, 10; Octyldodeceth-n, where n=5, 10, 16, 20, 25, 30; Oleth-n, where n=2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 20, 23, 24, 25, 30, 35, 40, 44, 50, 106; PPG-2-Ceteareth-9; PPG-4-Ceteareth-12; PPG-10-Ceteareth-20; PPG-1-Ceteth-n, where n=1, 5, 10, 20; PPG-2-Ceteth-n, where n=1, 5, 10, 20; PPG-2-Ceteth-n, where n=5, 10, 20; PPG-4-Ceteth-n, where n=1, 5, 10, 20; PPG-5-Ceteth-20; PPG-8-Ceteth-n, where n=1, 2, 5, 10; PPG-n Cetyl Ether, where n=10, 20, 28, 30, 50; PPG-2 C12-15 Pareth-6; PPG-4 C13-15 Pareth-15; PPG-5 C9-15 Pareth-6; PPG-6 C9-11 Pareth-n, where n=5, 12, 11; PPG-3 C12-14 Sec-Pareth-7; PPG-4 C12-14 Sec-Pareth-5; PPG-5 C12-14 Sec-Pareth-7; PPG-5 C12-14 Sec-Pareth-9; PPG-1-Deceth-6; PPG-2-Deceth-10; PPG-4-Deceth-n, where n= 4, 6; PPG-6-Deceth-n, where n=4, 9; PPG-8 Deceth-6; PPG-14 Deceth-6; PPG-6-Decyltetradeceth-n, where n=12, 20, 30; PPG-13 Decyltetradeceth-24; PPG-20-Decyltetradeceth-10; PPG-9-Ethylhexeth-5; PPG-20-Glycereth-30; PPG-24-Glycereth-24; PPG-66-Glycereth-12; PPG-2-Isodeceth-n, where n=4, 6, 9, 12; PPG-3-Isodeceth-n, where n=1, 9; PPG-3-Isosteareth-9; PPG-12-Laneth-50; PPG-3-Laureth-9; PPG-4 Laureth-n, where n=2, 5, 7; PPG-6-Laureth-3; PPG-25-Laureth-25; PPG-9-Steareth-3; PPG-23-Steareth-34; PPG-30 Steareth-4; PPG-34-Steareth-3; PPG-1 Trideceth-6; PPG-4 Trideceth-6; PPG-6 Trideceth-8;

Sorbeth-n, where n= 6, 20, 30, 40; Tocophereth-n, where n= 5, 10, 12, 18, 50; Trideceth-n, where n=2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 15, 18, 20, 21, 50; Ceteth-n, where n= 1, 2, 3, 4, 5, 6, 7, 10, 12, 14, 15, 16, 17, 18, 20, 23, 24, 25, 30, 40, 45; Ceteareth-n, where n= 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 27, 28, 29, 30, 33, 34, 40, 50, 55, 60, 80, 100; Cetoeth-n, where n= 6, 10, 11, 15, 20, 22, 24, 25, 30; Choleth-n, where n= 5, 10, 15, 20, 24, 30; Steareth-n, where n= 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 14, 15, 16, 20, 21, 25, 27, 30, 40, 50, 80, 100; Beheneth-n, where n=5, 10, 20, 25, 30.

Non-limiting examples of anionic surfactants which may be employed as emulsifiers include: Alkyl ether sulfates, Alkyl sulfates,  $\alpha$ -Olefin sulfonates, sulfocuccinates, Alkyl isethionates, Acyl amides, Acyl peptides, Alkyl ether carboxylates, Alkyl phosphates, Acylamphoglycinates, Acylamphopropionates and Amine oxides, Ammonium C12-15 Alkyl Sulfate, Ammonium Capryleth Sulfate, Ammonium Coco-Sulfate, Ammonium C12-15 Pareth Sulfate, Ammonium Laureth-n Sulfate, where n=3, 5, 7, 9, 12; Ammonium Lauryl Sulfate, Ammonium Myreth Sulfate, Ammonium Myristyl Sulfate, Ammonium Nonoxynol-4 Sulfate, Ammonium Nonoxynol-30 Sulfate, DEA-C12-13 Alkyl Sulfate, DEA-C12-15 Alkyl Sulfate, DEA-Cetyl Sulfate, DEA-C12-13 Pareth-3 Sulfate, DEA-Laureth Sulfate, DEA-Lauryl Sulfate, DEA-Myreth Sulfate, DEA-Myristyl Sulfate, Magnesium Coco-Sulfate, Magnesium Laureth-n Sulfate, where n=2, 5, 8, 16; Magnesium Lauryl Sulfate, Magnesium Myreth Sulfate, Magnesium Oleth Sulfate, Magnesium PEG-3 Cocamide Sulfate, Magnesium Sulfate, Magnesium/TEA-Coco-Sulfate, MEA-Laureth Sulfate, MEA-Lauryl Sulfate,

MIPA C12-15 Pareth Sulfate, MIPA-Laureth Sulfate, MIPA-Lauryl Sulfate, Mixed Isopropanolamines Lauryl Sulfate, Potassium Glycol Sulfate, Potassium Lauryl Sulfate, Potassium Persulfate, Potassium Sulfate, 5 Protamine Sulfate, Sodium C8-10 Alkyl Sulfate, Sodium C12-13 Alkyl Sulfate, Sodium C12-15 Alkyl Sulfate, Sodium C12-18 Alkyl Sulfate, Sodium C16-20 Alkyl Sulfate, Sodium Cellulose Sulfate, Sodium Cetearyl Sulfate, Sodium Cetyl Sulfate, Sodium Cholesteryl 10 Sulfate, Sodium Chondroitin Sulfate, Sodium Coceth Sulfate, Sodium Coceth-30 Sulfate, Sodium Coco/Babassu Sulfate, Sodium Coco/Hydrogenated Tallow Sulfate, Sodium Cocomonoglyceride Sulfate, Sodium Coco-Sulfate, Sodium C9-15 Pareth-3 Sulfate, Sodium C10-15 Pareth 15 Sulfate, Sodium C12-13 Pareth Sulfate, Sodium C12-15 Pareth Sulfate, Sodium C13-15 Pareth-3 Sulfate, Sodium C12-14 Sec-Pareth Sulfate, Sodium Cyclodextrin Sulfate, Sodium Deceth Sulfate, Sodium Decyl Sulfate, Sodium Dermatan Sulfate, Sodium Dextran Sulfate, 20 Sodium Dicocoylethylenediamine PEG-15 Sulfate, Sodium Ethylhexyl Sulfate, Sodium Laneth Sulfate, Sodium Laureth Sulfate, where n=2, 2, 5, 7, 8, 12, 40; Sodium Lauryl Sulfate, Sodium/MEA-PEG-3 Cocamide Sulfate, Sodium Myreth Sulfate, Sodium Myristyl Sulfate, Sodium 25 Nonoxynol-1 Sulfate, Sodium Nonoxynol-3 Sulfate, Sodium Nonoxynol-4 Sulfate, Sodium Nonoxynol-6 Sulfate, Sodium Nonoxynol-8 Sulfate, Sodium Nonoxynol-10 Sulfate, Sodium Nonoxynol-25 Sulfate, Sodium Octoxynol-2 Sulfate, Sodium Octoxynol-6 Sulfate, 30 Sodium Octoxynol-9 Sulfate, Sodium Oleth Sulfate, Sodium Oleyl Sulfate, Sodium Stearoyl Chondroitin Sulfate, Sodium Stearyl Sulfate, Sodium Sucrose

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Octasulfate, Sodium Tallow Sulfate, Sodium Trideceth Sulfate, Sodium Tridecyl Sulfate, TEA-C10-15 Alkyl Sulfate, TEA-C12-13 Alkyl Sulfate, TEA-C12-14 Alkyl Sulfate, TEA-C12-15 Alkyl Sulfate, TEA-Coco-Sulfate, 5 TEA-C12-13 Pareth-3 Sulfate, TEA-Laneth-5 Sulfate, TEA-Laureth Sulfate, TEA-Lauryl Sulfate, TEA-Oleyl Sulfate, TEA-PEG-3 Cocamide Sulfate, TIPA-Laureth Sulfate, TIPA-Lauryl Sulfat

Ammonium C9-10 Perfluoroalkylsulfonate, Ammonium 10 Cumenesulfonate, Ammonium Dodecylbenzenesulfonate, Ammonium Xylenesulfonate, Calcium Dodecylbenzenesulfonate, Calcium Lignosulfonate, Calcium Pantetheine Sulfonate, Cocamidopropyl Dimethylammonium C8-16 Isoalkylsuccinyl Lactoglobulin 15 Sulfonate, DEA-Dodecylbenzenesulfonate, DEA-Methyl Myristate Sulfonate, Disodium Bisethylphenyl Triaminotriazine Stilbenedisulfonate, Disodium Cetyl Phenyl Ether Disulfonate, Disodium Cocoamphocarboxyethyl-hydroxypropylsulfonate, Disodium 20 Decyl Phenyl Ether Disulfonate, Disodium Distyrylbiphenyl Disulfonate, Disodium Lauriminobishydroxypropylsulfonate, Disodium Lauryl Phenyl Ether Disulfonate, Disodium Methylene Dinaphthalenesulfonate, Isopropylamine 25 Dodecylbenzenesulfonate, Magnesium Lauryl Hydroxypropyl Sulfonate, MIPA-Dodecylbenzenesulfonate, Potassium Cumenesulfonate, Potassium Dodecylbenzenesulfonate, Potassium Lauryl Hydroxypropyl Sulfonate, Potassium Phenylbenzimidazole 30 Sulfonate, Potassium Toluenesulfonate, Potassium Xylene Sulfonate, Sodium Benzotriazolyl Butylphenol Sulfonate, Sodium C13-17 Alkane Sulfonate, Sodium C14-

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18 Alkane Sulfonate, Sodium C9-22 Alkyl Sec Sulfonate,  
 Sodium C14-17 Alkyl Sec Sulfonate, Sodium  
 Caproamphohydroxypropylsulfonate, Sodium  
 Capryloamphohydroxy-propylsulfonate, Sodium Caprylyl  
 5 Sulfonate, Sodium C8-16 Isoalkylsuccinyl Lactoglobulin  
 Sulfonate, Sodium Cocoamphohydroxypropylsulfonate,  
 Sodium Cocoglyceryl Ether Sulfonate, Sodium  
 Cocomonoglyceride Sulfonate, Sodium C12-14 Olefin  
 Sulfonate, Sodium C14-16 Olefin Sulfonate, Sodium C14-  
 10 18 Olefin Sulfonate, Sodium C16-18 Olefin Sulfonate,  
 Sodium C14-15 Pareth-PG Sulfonate, Sodium C12-15  
 Pareth-3 Sulfonate, Sodium C12-15 Pareth-7 Sulfonate,  
 Sodium C12-15 Pareth-15 Sulfonate, Sodium  
 Cumenesulfonate, Sodium Decylbenzenesulfonate, Sodium  
 15 Dodecylbenzenesulfonate, Sodium Guaiazulene Sulfonate,  
 Sodium Hexyldiphenyl Ether Sulfonate, Sodium  
 Hydroxymethane Sulfonate, Sodium  
 Lauroamphohydroxypropylsulfonate, Sodium  
 Lignosulfonate, Sodium Methyl-naphthalenesulfonate,  
 20 Sodium Naphthalenesulfonate, Sodium Naphthol  
 Sulfonate, Sodium m-Nitrobenzenesulfonate, Sodium  
 Octoxynol-2 Ethane Sulfonate, Sodium  
 Oleoamphohydroxypropylsulfonate, Sodium Palm Glyceride  
 Sulfonate, Sodium Pantetheine Sulfonate, Sodium  
 25 Phenolsulfonate, Sodium Phenylbenzimidazole Sulfonate,  
 Sodium Polydimethylglycinophenolsulfonate, Sodium  
 Polynaphthalenesulfonate, Sodium Polystyrene  
 Sulfonate, Sodium Shale Oil Sulfonate, Sodium  
 Stearoamphohydroxypropylsulfonate, Sodium Stearoyl PG-  
 30 Hydroxyethylcellulose Sulfonate, Sodium  
 Toluenesulfonate, Sodium Tridecylbenzenesulfonate,  
 Sodium Xylenesulfonate, TEA-Dodecylbenzenesulfonate,

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TEA-Phenylbenzimidazole Sulfonate, TEA-Tridecylbenzenesulfonate.

Ammonium Lauryl Sulfosuccinate, Cholesteryl C16-18 Alkenyl Succinate, Decyl Succinate, Diammonium  
 5 Lauramido-MEA Sulfosuccinate, Diammonium Lauryl Sulfosuccinate, Diammonium Oleamido PEG-2 Sulfosuccinate, Diamyl Sodium Sulfosuccinate, Dicapryl Sodium Sulfosuccinate, Dicyclohexyl Sodium Sulfosuccinate, Diethoxyethyl Succinate, Diethylhexyl  
 10 Sodium Sulfosuccinate, Diethylhexyl Succinate, Diethyl Succinate, Diglycol Guanidine Succinate, Diheptyl Sodium Sulfosuccinate, Disodium Cetearyl Sulfosuccinate, Disodium Cocamido MEA-Sulfosuccinate, Disodium Cocamido MIPA-Sulfosuccinate, Disodium  
 15 Cocamido PEG-3 Sulfosuccinate, Disodium Coco-Glucoside Sulfosuccinate, Disodium Cocoyl Butyl Gluceth-10 Sulfosuccinate, Disodium C12-15 Pareth Sulfosuccinate, Disodium C12-14 Sec-Pareth Sulfosuccinate, Disodium C12-14 Sec-Pareth-5 Sulfosuccinate, Disodium C12-14  
 20 Sec-Pareth-7 Sulfosuccinate, Disodium C12-14 Sec-Pareth-9 Sulfosuccinate, Disodium C12-14 Sec-Pareth-12 Sulfosuccinate, Disodium Cystinyl Disuccinate, Disodium Deceth-5 Sulfosuccinate, Disodium Deceth-6 Sulfosuccinate, Disodium Dimethicone Copolyol  
 25 Sulfosuccinate, Disodium Hydrogenated Cottonseed Glyceride Sulfosuccinate, Disodium Isodecyl Sulfosuccinate, Disodium Isostearamido MEA-Sulfosuccinate, Disodium Isostearamido MIPA-Sulfosuccinate, Disodium Isostearyl Sulfosuccinate,  
 30 Disodium Laneth-5 Sulfosuccinate, Disodium Lauramido MEA-Sulfosuccinate, Disodium Lauramido PEG-2 Sulfosuccinate, Disodium Lauramido PEG-5

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Sulfosuccinate, Disodium Laureth Sulfosuccinate,  
 Disodium Laureth-6 Sulfosuccinate, Disodium Laureth-9  
 Sulfosuccinate, Disodium Laureth-12 Sulfosuccinate,  
 Disodium Lauryl Sulfosuccinate, Disodium Myristamido  
 5 MEA-Sulfosuccinate, Disodium Nonoxynol-10  
 Sulfosuccinate, Disodium Oleamido MEA-Sulfosuccinate,  
 Disodium Oleamido MIPA-Sulfosuccinate, Disodium  
 Oleamido PEG-2 Sulfosuccinate, Disodium Oleth-3  
 Sulfosuccinate, Disodium Oleyl Sulfosuccinate,  
 10 Disodium Palmitamido PEG-2 Sulfosuccinate, Disodium  
 Palmitoleamido PEG-2 Sulfosuccinate, Disodium PEG-4  
 Cocamido MIPA-Sulfosuccinate, Disodium PEG-5  
 Laurylcitrate Sulfosuccinate, Disodium PEG-8 Palm  
 Glycerides Sulfosuccinate, Disodium PEG-8  
 15 Ricinosuccinate, Disodium Ricinoleamido MEA-  
 Sulfosuccinate, Disodium Sitostereth-14  
 Sulfosuccinate, Disodium Stearamido MEA-  
 Sulfosuccinate, Disodium Stearyl Sulfosuccinate,  
 Disodium Succinate, Disodium Tallamido MEA-  
 20 Sulfosuccinate, Disodium Tallowamido MEA-  
 Sulfosuccinate, Disodium Tetrapropenyl Succinate,  
 Disodium Tridecylsulfosuccinate, Disodium  
 Undecylenamido MEA-Sulfosuccinate, Disodium  
 Undecylenamido PEG-2 Sulfosuccinate, Disodium Wheat  
 25 Germamido MEA-Sulfosuccinate, Disodium Wheat Germamido  
 PEG-2 Sulfosuccinate, Di-TEA-Oleamido PEG-2  
 Sulfosuccinate, Glyceryl Stearate Succinate,  
 Hydroxypropyl Methylcellulose Acetate/Succinate,  
 Isostearyl Diglyceryl Succinate, Methoxy-PEG-7 Rutinyl  
 30 Succinate, PEG-20 Hexadecenylsuccinate, PEG-50  
 Hydrogenated Castor Oil Succinate, PEG-3 PPG-20  
 Succinate, Potassium Dextrin Octenylsuccinate,

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Potassium PEG-50 Hydrogenated Castor Oil Succinate,  
 Sodium Bisglycol Ricinosulfosuccinate, Sodium Dextrin  
 Octenylsuccinate, Sodium/MEA Laureth-2 Sulfosuccinate,  
 Sodium PEG-50 Hydrogenated Castor Oil Succinate,  
 5 Sodium Starch Octenylsuccinate, TEA-Dextrin  
 Octenylsuccinate, TEA-PEG-50 Hydrogenated Castor Oil  
 Succinate.

Ammonium Laureth-6 Carboxylate, Ammonium Laureth-  
 8 Carboxylate, Cetyl C12-15-Pareth-9 Carboxylate,  
 10 Cetyl PPG-2 Isodeceth-7 Carboxylate, Isopropyl C12-15-  
 Pareth-9 Carboxylate, Isopropyl PPG-2-Isodeceth-7  
 Carboxylate, Magnesium Laureth-11 Carboxylate, MEA-  
 Laureth-6 Carboxylate, MEA PPG-6 Laureth-7  
 Carboxylate, MEA-PPG-8-Steareth-7 Carboxylate,  
 15 Potassium Laureth-3 Carboxylate, Potassium Laureth-4  
 Carboxylate, Potassium Laureth-5 Carboxylate,  
 Potassium Laureth-6 Carboxylate, Potassium Laureth-10  
 Carboxylate, Potassium Trideceth-n, where n=3, 3, 7,  
 15, 19, Sodium Capryleth-2 Carboxylate, Sodium  
 20 Capryleth-9 Carboxylate, Sodium Ceteth-13 Carboxylate,  
 Sodium C9-11 Pareth-6 Carboxylate, Sodium C11-15  
 Pareth-7 Carboxylate, Sodium C12-13 Pareth-n  
 Carboxylate, where n=6, 8, 12, Sodium C12-15 Pareth-n  
 Carboxylate, where n= 6, 7, 8, Sodium C14-15 Pareth-8  
 25 Carboxylate, Sodium C12-14 Sec-Pareth-8 Carboxylate,  
 Sodium Isosteareth-6 Carboxylate, Sodium Isosteareth-  
 11 Carboxylate, Sodium Laureth-3 Carboxylate, Sodium  
 Laureth-n Carboxylate, where n= 4, 5, 6, 8, 11, 12,  
 13, 14, 17, Sodium Lauryl Glycol Carboxylate, Sodium  
 30 PEG-6 Cocamide Carboxylate, Sodium PEG-8 Cocamide  
 Carboxylate, Sodium PEG-3 Lauramide Carboxylate,  
 Sodium PEG-4 Lauramide Carboxylate, Sodium PEG-7 Olive

FOI b7c b7d b7e b7f b7g b7h b7i b7j b7k b7l b7m b7n b7o b7p b7q b7r b7s b7t b7u b7v b7w b7x b7y b7z

Oil Carboxylate, Sodium PEG-8 Palm Glycerides Carboxylate, Sodium Trideceth-3 Carboxylate, where  $n=3, 4, 6, 7, 8, 12, 15, 19$ , Sodium Undeceth-5 Carboxylate.

5 Ammonium Cocoyl Sarcosinate, Ammonium Lauroyl Sarcosinate, Isopropyl Lauroyl Sarcosinate, Potassium Cocoyl Sarcosinate, Potassium Lauroyl Sarcosinate, Sodium Cocoyl Sarcosinate, Sodium Lauroyl Sarcosinate, Sodium Myristoyl Sarcosinate, Sodium Palmitoyl  
10 Sarcosinate, TEA-Cocoyl Sarcosinate, TEA-Lauroyl Sarcosinate, TEA-Oleoyl Sarcosinate, TEA-Palm Kernel Sarcosinate, Palmitoyl Oligopeptide, Pantothenic Acid Polypeptide, Ammonium Cocoyl Isethionate, Dibromopropamide Diisethionate, Hexamidine  
15 Diisethionate, Sodium Cocoyl Isethionate, Sodium Isethionate, Sodium Lauroyl Isethionate, Sodium Myristoyl Isethionate, Sodium Oleoyl Isethionate.

Aluminum Dicetyl Phosphate, Benzalkonium Cetyl Phosphate, C8-10 Alkyl Ethyl Phosphate, C9-15 Alkyl  
20 Phosphate, Ceteareth-2 Phosphate, Ceteareth-4 Phosphate, Ceteareth-5 Phosphate, Ceteareth-10 Phosphate, Ceteth-8 Phosphate, Ceteth-10 Phosphate, Cetyl Phosphate, Cocamidopropyl PG-Dimonium Chloride Phosphate, Cocoyl Hydroxyethylimidazolinium PG-  
25 Chloride Phosphate, C6-10 Pareth-4 Phosphate, C12-13 Pareth-10 Phosphate, C12-15 Pareth- $n$  Phosphate, where  $n=2, 3, 6, 8, 9, 10$ ; C12-16 Pareth-6 Phosphate, DEA-Ceteareth-2 Phosphate, DEA-Cetyl Phosphate, DEA-C8-18 Perfluoroalkylethyl Phosphate, DEA-Oleth-3 Phosphate,  
30 DEA-Oleth- $n$  Phosphate, where  $n=5, 10, 20$ ; DEA-Polyperfluoroethoxymethoxy PEG-2 Phosphate, Deceth-9 Phosphate, Deceth-4 Phosphate, Deceth-6 Phosphate,

Diceteareth-10 Phosphate, Dicetyl Phosphate, Di-C12-15  
Pareth-n Phosphate, where n= 2, 4, 6, 8, 10;  
Dilaureth-4 Phosphate, Dilaureth-10 Phosphate,  
Dimyristyl Phosphate, Dioleth-8 Phosphate, Disodium  
5 Lauryl Phosphate, Disodium Oleyl Phosphate, Glycereth-  
26 Phosphate, Hydrogenated Vegetable Glycerides  
Phosphate, Hydroxyethyl Cetyldimonium Phosphate,  
Isosteareth-2 Phosphate, Laneth-4 Phosphate, Laureth-n  
Phosphate, where n=1, 2, 3, 4, 7, 8; Lauryl Phosphate,  
10 Linoleamidopropyl PG-Dimonium Chloride Phosphate,  
Manganese Glycerophosphate, MEA-Dicetearyl Phosphate,  
Myristamidopropyl Dimethylamine Dimethicone Copolyol  
Phosphate, Myristamidopropyl Dimethylamine Phosphate,  
Nonoxynol-3 Phosphate, Nonoxynol-4 Phosphate,  
15 Nonoxynol-6 Phosphate, Nonoxynol-9 Phosphate,  
Nonoxynol-10 Phosphate, Nonyl Nonoxynol-n Phosphate,  
where n=7, 8, 9, 10, 11, 15, 24, Oleth-n Phosphate,  
where n=2, 3, 4, 5, 10, 20, Oleyl Ethyl Phosphate,  
Oleyl Phosphate, Palmeth-2 Phosphate, PEG-15 Cocamine  
20 Oleate/Phosphate, PEG-26-PPG-30 Phosphate, PEG-45  
Stearate Phosphate, Potassium C9-15 Alkyl Phosphate,  
Potassium C12-13 Alkyl Phosphate, Potassium Cetyl  
Phosphate, Potassium Deceth-4 Phosphate, Potassium  
Dihydroxyethyl Cocamine Oxide Phosphate, Potassium  
25 Dimethicone Copolyol Panthenyl Phosphate, Potassium  
Dimethicone Copolyol Phosphate, Potassium  
Glycerophosphate, Potassium Isosteareth-2 Phosphate,  
Potassium Lauryl Phosphate, Potassium  
Monofluorophosphate, Potassium Trideceth-6 Phosphate,  
30 PPG-21 Butyl Ether Phosphate, PPG-25 Butyl Ether  
Phosphate, PPG-35 Butyl Ether Phosphate, PPG-5-Ceteth-  
10 Phosphate, PPG-10 Cetyl Ether Phosphate, Sodium

Coco PG-Dimonium Chloride Phosphate, Sodium C13-15  
 Pareth-8 Butyl Phosphate, Sodium C13-15 Pareth-8  
 Phosphate, Sodium Diceteareth-10 Phosphate, Sodium  
 Dihydroxycetyl Phosphate, Sodium Dilaureth-10  
 5 Phosphate, Sodium Dioleth-8 Phosphate, Sodium  
 Emuamidopropyl PG-Dimonium Chloride Phosphate, Sodium  
 Glyceryl Oleate Phosphate, Sodium Laureth-4 Phosphate,  
 Sodium Lauroampho PG-Acetate Phosphate, Sodium Lauryl  
 Phosphate, Sodium Milkamidopropyl PG-Dimonium Chloride  
 10 Phosphate, Sodium Monofluorophosphate, Sodium  
 Oleamidopropyl PG-Dimonium Chloride Phosphate, Sodium  
 Oleth-7 Phosphate, Sodium Oleth-8 Phosphate, Sodium  
 Olivamidopropyl PG-Dimonium Chloride Phosphate, Sodium  
 Steareth-4 Phosphate, Sodium Sunfloweramidopropyl PG-  
 15 Dimonium Chloride Phosphate, Sodium Zinc Cetyl  
 Phosphate, Stearamidoethyl Diethylamine Phosphate,  
 Stearamidoethyl Ethanolamine Phosphate,  
 Stearamidopropyl PG-Dimonium Chloride Phosphate,  
 Steardimonium Hydroxypropyl PEG-7 Dimethicone  
 20 Phosphate, Steareth-2 Phosphate, Steareth-3 Phosphate,  
 Stearyl PG-Dimonium Chloride Phosphate, Stearyl  
 Phosphate, TEA-C12-13 Alkyl Phosphate, TEA-Dimethicone  
 Copolyol Phosphate, TEA-Polyphosphatel Triceteareth-4  
 Phosphate, Triceteth-5 Phosphate, Tricetyl Phosphate,  
 25 Tri-C12-15 Pareth-n Phosphate, where  $n=2, 6, 8, 10$ ,  
 Tricresyl Phosphate, Trideceth-n Phosphate, where  $n=3,$   
 6, 10, Trilaureth-4 Phosphate, Trilauryl Phosphate,  
 Trioleth-8 Phosphate, Trioyleyl Phosphate, Trisodium  
 Lauroampho PG-Acetate Chloride Phosphate, Tristearyl  
 30 Phosphate.

Non-limiting examples of amphoteric surfactants  
 which may be employed as emulsifiers include:



Almondamido-propyl Betaine, Apricotamidopropyl  
 Betaine, Avocadamidopropyl Betaine, Babassuamidopropyl  
 Betaine, Behenamidopropyl Betaine, Behenyl Betaine,  
 Canolamidopropyl Betaine, Capryl/Capramidopropyl  
 5 Betaine, Cetyl Betaine, Cocamidoethyl Betaine,  
 Cocamidopropyl Betaine, Coco-Betaine, Coco/  
 Oleamidopropyl Betaine, Decyl Betaine, Hydrogenated  
 Tallow Betaine, Isostearamidopropyl Betainem  
 Lauramidopropyl Betaine, Lauryl Betaine,  
 10 Milkamidopropyl Betaine, Minkamidopropyl Betaine,  
 Myristamidopropyl Betaine, Myristyl Betainem  
 Oleamidopropyl Betaine, Oleyl Betaine, Olivamidopropyl  
 Betaine, Palmamidopropyl Betaine, Palmitamidopropyl  
 Betaine, Palm Kernelamidopropyl Betaine,  
 15 Polytetrafluoroethylene Acetoxypropyl Betaine,  
 Ricinoleamidopropyl Betaine, Sesamidopropyl Betaine,  
 Soyamidopropyl Betaine, Stearamidopropyl Betaine,  
 Stearyl Betaine, Tallowamidopropyl Betaine, Tallow  
 Betaine, Tallow Dihydroxyethyl Betaine,  
 20 Undecylenamidopropyl Betaine, Wheat Germamidopropyl  
 Betaine.

Almondamidopropylamine Oxide, Babassuamidopropyl-  
 amine Oxide, Behenamine Oxide, Cocamidopropylamine  
 Oxide, Cocamine Oxide, Decylamine Oxide,  
 25 Decyltetradecylamine Oxide, Diaminopyrimidine Oxide,  
 Dihydroxyethyl C8-10 Alkoxypropylamine Oxide,  
 Dihydroxyethyl C9-11 Alkoxypropylamine Oxide,  
 Dihydroxyethyl C12-15 Alkoxypropylamine Oxide,  
 Dihydroxyethyl Cocamine Oxide, Dihydroxyethyl  
 30 Lauramine Oxide, Dihydroxyethyl Stearamine Oxide,  
 Dihydroxyethyl Tallowamine Oxide, Hydrogenated Palm  
 Kernel Amine Oxide, Hydrogenated Tallowamine Oxide,

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Hydroxyethyl Hydroxypropyl C12-15 Alkoxypropylamine  
 Oxide, Isostearamidopropylamine Oxide,  
 Isostearamidopropyl Morpholine Oxide,  
 Lauramidopropylamine Oxide, Lauramine Oxide,  
 5 Laurtrimonium Trichlorophenoxide, Milkamidopropyl  
 Amine Oxide, Minkamidopropylamine Oxide,  
 Myristamidopropylamine Oxide, Myristamine Oxide,  
 Myristyl/Cetyl Amine Oxide, Oleamidopropylamine Oxide,  
 Oleamine Oxide, Olivamidopropylamine Oxide,  
 10 Palmitamidopropylamine Oxide, PPalmitamine Oxide, PEG-  
 3 Lauramine Oxide, Sesamidopropylamine Oxide,  
 Soyamidopropylamine Oxide, Stearamidopropylamine  
 Oxide, Stearamine Oxide, Tallowamidopropylamine Oxide,  
 Tallowamine Oxide, Wheat Germamidopropylamine Oxide.

15 In one embodiment, the composition comprises  
 about 0.01% to about 10% of an emulsifier component,  
 preferably about 0.01% to about 8%, more preferably  
 0.1% to about 5%, even more preferably 0.1% to about  
 5%. Preferably, the emulsifier components form micro  
 20 emulsions with the polysiloxane components.

In one embodiment, the composition comprises  
 about 0.01% to about 10% of a non-ionic emulsifier,  
 preferably about 0.01% to about 8%, more preferably  
 0.1% to about 5%, even more preferably 0.1% to about  
 25 5%. Preferably, the emulsifier components form micro  
 emulsions with the polysiloxane components.

In one embodiment, the composition comprises  
 about 0.01% to about 5% of a non-ionic emulsifier and  
 at least one of about 0.1% to about 5% of an anionic  
 30 emulsifier/surfactant and an amphoteric  
 emulsifier/surfactant.

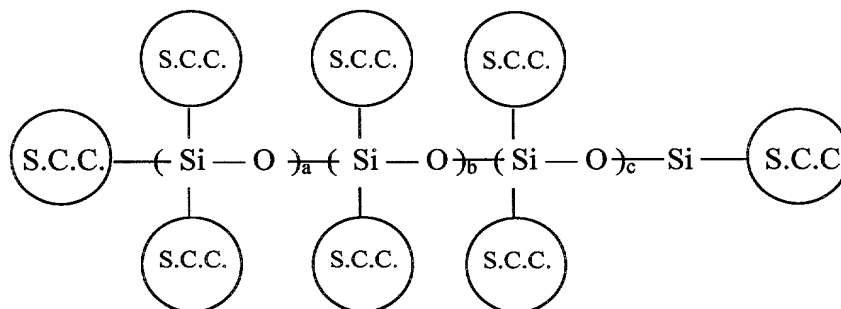
In one embodiment, the composition comprises  
 about 0.01% to about 10% of a polysiloxane component.  
 Preferably, the composition comprises about .05% to

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about 6%, more preferably about 0.10% to about 5% of the polysiloxane component.

The popularity of polysiloxane, or dimethicone and dimethicone derivatives, in shampoo compositions originate from their chemical and physical properties. There is a weak inter-molecular interaction between polysiloxane molecules and continuing rotation around Si—C and Si—O bonds of the polysiloxane molecules because of the longer Si—C and Si—O than C—C and C—O in regular organic compound. Thus, there is much more space around the silicon atoms and therefore render the polysiloxane excellent spreadability. Polysiloxane and derivatives also have high refractive index. Furthermore, polysiloxane and derivatives can deliver a smooth feel, detangling and sheen effect to hair.

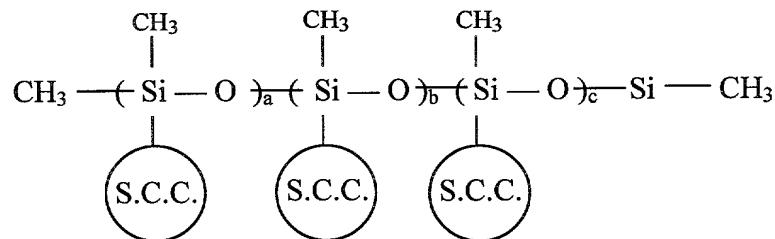
In one embodiment, the polysiloxane component has the general formula:



wherein a, b and c are independently 0 to about 1000, preferably 0 to about 500, more preferably 0 to about 100. "s.c.c." as used herein means side chain component. A side chain component is any atom, molecule, polymer or chemical entity which may be covalently attached to the Si of the polysiloxane component. For example, one side chain component may be a hydrocarbon, for example a C1-C10 hydrocarbon or

a hydroxide, and another side chain component on the same polysiloxane component may be a hydroxide

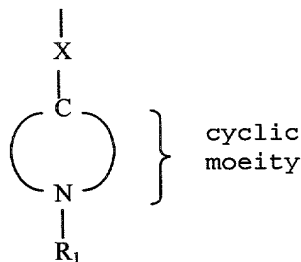
In a preferred embodiment, the polysiloxane component has the general formula:



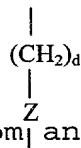
wherein a, b and c are independently 0 to about 50.

In a preferred embodiment, the polysiloxane component comprises about 2 to about 1000 Si, preferably about 4 to about 500 Si, more preferably about 10 to about 300 Si.

In one embodiment, the polysiloxane component comprises at least one side chain component A having the general formula:

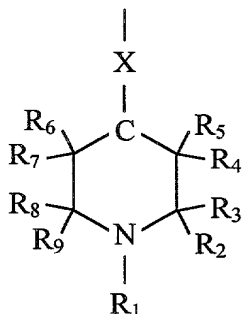


R<sub>1</sub> is an H or a C<sub>1</sub>-C<sub>5</sub> hydrocarbon, and X is a C<sub>1</sub>-C<sub>10</sub> hydrocarbon, a heteroatom or

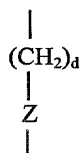


wherein Z is a heteroatom and d is 0 to about 6. Non-limiting examples of heteroatoms useful in this invention includes N, O, S and P. In a preferred embodiment, Z is O (oxygen) and d is about 3.

In one embodiment, the cyclic moiety of the side chain component is saturated. In another embodiment, the cyclic moiety is substituted. For example, the a side chain component A of the polysiloxane component may include the general formula:

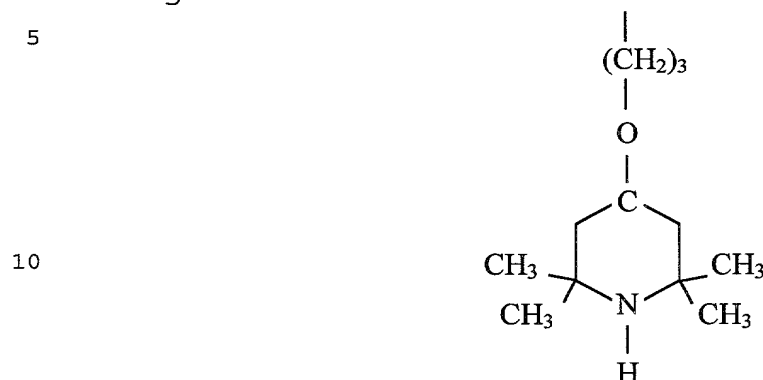


wherein R1, R2, R3, R4, R5, R6, R7, R8 and R9 are independently an H, a C1-C10 hydrocarbon, an ester, carboxyl or a halogen, and X is a C1-C10 hydrocarbon, a heteroatom or



wherein Z is a heteroatom and d is 0 to about 6. Preferably, X is a C1-C5 hydrocarbon or a heteroatom. In one embodiment, X is a heteroatom selected from the group consisting of N, O, Si, P, and S. In a preferred embodiment, R1, R4, R5, R6 and R7 are H's and R2, R3, R8 and R9 are C1 alkyls. Also, in a preferred embodiment, the cyclic moiety is a 5 or 6 member ring.

For example, a side chain component A of a preferred polysiloxane component of this invention has the general formula:



Side chain component A employed in accordance with this invention preferably has a "hindered amine", or a secondary restricted monoamine function group. Preferably, the molecules can be partially protonated at normal shampoo pH range (pH 4-7). The hindered amine functional group is believed to render several beneficial effects. For example, it is believed that the hindered amine polysiloxane (or dimethicone) has more hair or skin affinity and give more conditioning effects. Furthermore, a shampoo comprising a polysiloxane component with a hindered amine functional group is more stable gives more hair softness, smoothness and shine than a shampoo which does not have a hindered amine group.

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In one embodiment, the ratio of the Si to the side chain component A in a polysiloxane component is 1:1, preferably 1:0.1, more preferably 1:0.01, even more preferably 1:0.001.

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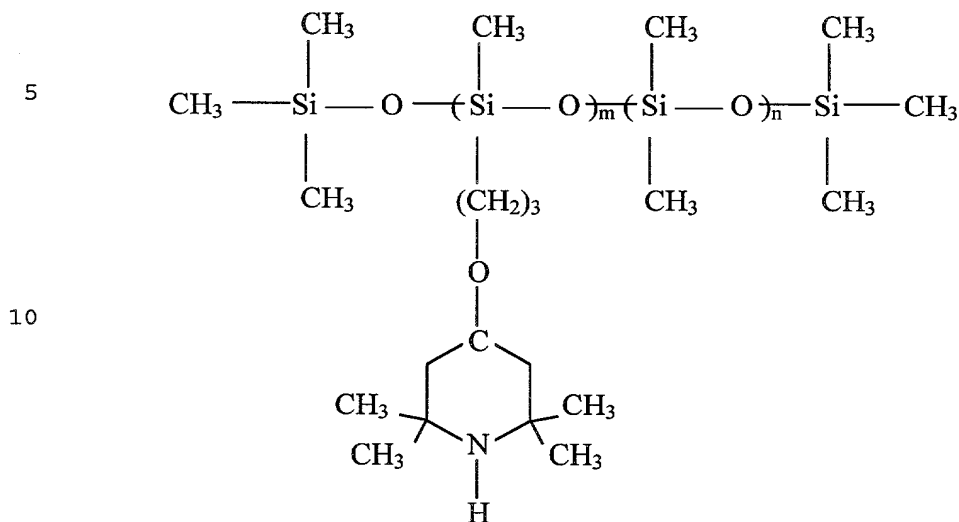
In one embodiment, every other Si of the polysiloxane component has a side chain component A. In another embodiment, every third Si has the side chain component A. In yet another embodiment, every fourth, fifth or sixth Si has a side chain component A.

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In one embodiment, a polysiloxane component comprises a set of adjacent Si's of the polysiloxane component having side chain component A followed by a set of adjacent Si's having side chain components

40

which are not side chain component A. See, for example, the molecule M below:



wherein m and n are independently 0 to about 200. See also the molecules identified at [www.nicnas.gov.au/publications/CAR/new/NA/NAFULLR/NA0800FR/NA819FR.pdf](http://www.nicnas.gov.au/publications/CAR/new/NA/NAFULLR/NA0800FR/NA819FR.pdf) as of November 30, 2001, the disclosure of which is incorporated in its entirety herein by reference. In a preferred embodiment, the polysiloxane component comprises propoxytetramethyl piperidinyldimethicone. Preferably, the propoxytetramethyl piperidinyldimethicone has a molecular weight of about 10,000 to about 100,000.

In one embodiment, the polysiloxane component has a viscosity in the range of about 1 cps (centistoke) to about 1,000,000 cps (centistoke). Preferably, the polysiloxane component has a viscosity in the range of about 100 cps to about 500,000 cps. More preferably, the polysiloxane component has a viscosity in the range of about 1,000 cps to about 100,000 cps. For example, the polysiloxane component may have a viscosity of about 3,000 cps to about 4,000 cps, preferably about 3,500 cps.

In one embodiment, the polysiloxane component has a viscosity in the range of less than about 1,000,000 cps (centistoke). Preferably, the polysiloxane

component has a viscosity of less than about 500,000 cps. More preferably, the polysiloxane component has a viscosity of less than about 100,000 cps. Even more preferably, the polysiloxane component has a viscosity  
5 of less than about 10,000 cps.

In one embodiment, the polysiloxane component has a viscosity in the range of more than about 1 cps (centistoke). Preferably, the polysiloxane component has a viscosity of more than about 1,000 cps. More  
10 preferably, the polysiloxane component has a viscosity of more than about 3,000 cps. Even more preferably, the polysiloxane component has a viscosity of more than about 10,000 cps.

The amine contents of the polysiloxane components  
15 vary with viscosity. The particular value of amine content corresponding to a certain range of viscosity may be determined readily by one of ordinary skill in the art. The amine content of the polysiloxane component may be about 200 to about 40,000 (ppm, N) at  
20 about room temperature.

In one embodiment, the polysiloxane component comprises the molecule M and has a viscosity of about 500 to about 6,000 cps at room temperature. In a preferred embodiment, the polysiloxane component  
25 comprises the molecule M and has a viscosity of about 1,000 to about 5,000 cps at room temperature. In a more preferred embodiment, the polysiloxane component comprises the molecule M and has a viscosity of about 2,000 to about 4,000 cps at room temperature. In an  
30 even more preferred embodiment, the polysiloxane component comprises the molecule M and has a viscosity of about 3,000 to about 4,000 cps, for example about 3,500 cps at room temperature.

In one embodiment, the polysiloxane component is  
35 water insoluble. In one embodiment, the polysiloxane component is a colorless, viscous liquid. In one embodiment, the shelf life of the polysiloxane is up to 12 months from date of manufacture.



In one embodiment, the composition comprises about 0.01% to about 10% of an emulsifier component and about 0.01% to about 10% of a polysiloxane component. In one embodiment, the emulsifier component is a mixture of non-ionic emulsifier and an anionic emulsifier (and/or amphoteric emulsifier). For example, the emulsifier component may comprise more than about 90%, more than about 80%, more than about 50%, more than about 30% or more than about 10% of non-ionic emulsifier.

Preferably, the emulsifier component and the polysiloxane component form a micro-emulsion. For example, an emulsifier component comprising an anionic emulsifier (e.g. Capryeth-3) and a non-ionic emulsifier (e.g. Undeceth-5) is added to propoxytetramethyl piperidinyl dimethicone and water to form a micro-emulsion of propoxytetramethyl piperidinyl dimethicone.

The mixture containing the micro-emulsion may be designated as "phase A". Phase A may be added to a deterative component, designated as "phase B", to form a clear composition. A deterative component comprises a chemical or formulation which is effective for cleaning, preferably cleaning hair. For example, the deterative component may comprise one or more of the anionic surfactants or amphoteric surfactants identified herein. In one embodiment, a deterative component may also include emulsifier components, for example the non-ionic emulsifiers above.

In one embodiment, the composition comprises about 5% to about 60% of the deterative component, preferably about 10% to about 50%, more preferably about 20% to about 40%, even more preferably about 20% to about 30%.

A deterative component may further comprise a shampoo additive component. Shampoo additive components include any chemical or formulation that adds to the beneficial qualities of a shampoo.

Shampoo additive components include, without limitation, ingredients for boosting foam, protecting the integrity of composition, increasing viscosity, covering the odor of raw material and increasing the attraction of the shampoo. Non-limiting examples of shampoo additive components include alkylamide MEA or alkylamide DEA, Sodium Chloride, preservatives, fragrance and colors.

In one embodiment, the composition comprises about 5% to about 60% (by weight) of the deterative component, 0.01% to about 10% (by weight) of the emulsifier component and about 0.01% to about 10% (by weight) of the polysiloxane component. Preferably, the polysiloxane component comprises a propoxytetramethyl piperidiny dimethicone.

In one embodiment, the ratio (by weight) of phase A:phase B is about 0.1:99.9, 1:99, 2:98.

We hereby incorporate the disclosures of Patent Nos. 5,540,952, 5,277,968 and 6,040,288 in their entirety by reference.

The invention is further illustrated by the following exemplar formulations, which are intended as illustrations only. The thermal and physical stabilities have been tested at both ambient and elevated (40°C) temperatures. Examples 1-7 are the clear deterative formulations. Examples 1-7 use the pre-emulsified microemulsion in the formula; therefore, it is easy to make stable and clear Propoxytetramethyl Piperidiny Dimethicone deterative emulsion. The composition is obtained by preparing phase A at 60-70 °C and incorporating silicone phase A into phase B at about 40-50 °C for clear deterative composition. The examples 8-11 are the opaque formulations and were made by directly dispersing the hindered amine silicone into surfactant system. The fragrance, preservatives and color are added and then

mixing at 40-50 °C afterwards. The pH for inventive  
deterative composition should be within 4-7 pH ranges.  
"q.s." means quantum sufficit, or as much as suffices.

Each of the percentages of the ingredients  
5 identified in the Examples below may be individually  
varied to be higher or lower by about 5% to about 40%,  
preferably about 5% to about 20%, more preferably  
about 5% to about 10%, and would still be considered  
to be within the scope of this invention.

10 In each of the Examples below, the viscosity of  
the identified polysiloxane component may be about 1  
cps to about 1,000,000 cps (centistoke). For example,  
the propoxytetramethyl piperidinyl dimethicone  
(Molecule M) of Example 1 may be about 2,000 cps; the  
15 propoxytetramethyl piperidinyl dimethicone (Molecule  
M) of Example 2 may be about 3,000 cps; the  
propoxytetramethyl piperidinyl dimethicone (Molecule  
M) of Example 3 may be about 3,500 cps; the  
propoxytetramethyl piperidinyl dimethicone (Molecule  
20 M) of Example 4 may be about 4,000 cps; the  
propoxytetramethyl piperidinyl dimethicone (Molecule  
M) of Example 5 may be about 100,000 cps; the  
propoxytetramethyl piperidinyl dimethicone (Molecule  
M) of Example 6 may be about 200,000 cps; the  
25 propoxytetramethyl piperidinyl dimethicone (Molecule  
M) of Example 7 may be about 400,000 cps.

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EXAMPLE 1

## Phase A

	Capryleth-3	1.12%
	Undeceth-5	1.68%
5	Propoxytetramethyl Piperidiny1 Dimethicone	6.40%
	Water	16.2%

## Phase B

	TEA-C12-13 Pareth-3 Sulfate	16.52%
10	Sodium Cocoamphohydroxypropylsulfonate	19.72%
	Cocamidopropyl Betaine	5.62%
	Lauramide MEA	4.36%
	Disodium EDTA	0.05%
	Fragrance	q.s.
15	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

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EXAMPLE 2

## Phase A

	C9-11 Pareth-3	0.70%
	C14-15 Pareth-7	0.89%
5	Propoxytetramethyl Piperidiny1 Dimethicone	4.30%
	Water	8.78%

## Phase B

	Sodium C9-15 Pareth-3 Sulfate	12.58%
10	Sodium Oleth Sulfate	18.72%
	Coco-Betaine, Coco/Oleamidopropyl Betaine	4.84%
	Linoleamide MEA	4.15%
	Sodium Chloride	1.70%
	Fragrance	q.s.
15	Preservatives	q.s.
	Color	q.s.
	Water	to 100%

TOP SECRET

EXAMPLE 3

## Phase A

	Glycereth-4	0.56%
	Isosteareth-6	0.85%
5	Propoxytetramethyl Piperidinyl Dimethicone	2.88%
	Water	8.05%

## Phase B

	Sodium Cocoamphohydroxypropylsulfonate	17.58%
10	Ammonium Dodecylbenzenesulfonate	18.72%
	Myristyl Betainem Oleamidopropyl Betaine	6.8%
	Myristamide MEA	4.53%
	Disodium EDTA	0.05%
	Fragrance	q.s.
15	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

EXAMPLE 4

## Phase A

	Oleth-3	0.48%
	PPG-2-Ceteth-5	0.70%
5	Propoxytetramethyl Piperidiny1 Dimethicone	3.50%
	Water	7.01%

## Phase B

	Sodium C12-15 Alkyl Sulfate	15.58%
10	Potassium Laureth-5 Carboxylate	18.72%
	Behenamide MEA	4.26%
	Soyamidopropyl Betaine	5.9%
	Disodium EDTA	0.05%
	Fragrance	q.s.
15	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

TOP SECRET

EXAMPLE 5

## Phase A

	Ceteth-3	0.24%
	Ceteareth-6	0.30%
5	Propoxytetramethyl Piperidiny1 Dimethicone	1.50%
	Water	3.0%

## Phase B

	Sodium C12-15 Alkyl Sulfate	13.58%
10	Sodium C12-15 Pareth Sulfate	18.72%
	Tallowamidopropylamine Oxide	4.3%
	Cocamide MEA	3.56%
	Disodium EDTA	0.05%
	Fragrance	q.s.
15	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%



### EXAMPLE 6

## Phase A

	Deceth-3	0.28%
	Trideceth-6	0.42%
5	Propoxytetramethyl Piperidinyl Dimethicone	1.40%
	Water	4.20%

## Phase B

	Sodium C9-15 Pareth-3 Sulfate	12.58%
10	Sodium C12-13 Alkyl Sulfate	18.72%
	Cocamide MEA	3.37%
	Apricotamidopropyl Betaine	4.4%
	Disodium EDTA	0.05%
	Fragrance	q.s.
15	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

EXAMPLE 7

## Phase A

	Undeceth-3	0.06%
	C14-15 Pareth-7	0.075%
5	Propoxytetramethyl Piperidiny1 Dimethicone	0.40%
	Water	0.75%

## Phase B

	Sodium Oleth Sulfate	12.58%
10	Sodium Myristyl Sulfate	18.72%
	Ricinoleamidopropyl Betaine	3.95%
	Cocamide MEA	3.84%
	Disodium EDTA	0.05%
	Fragrance	q.s.
15	Sodium Chloride	1.70%
	Preservatives	q.s.
	Color	q.s.
	Water	to 100%

T O T A L

EXAMPLE 8

	Sodium Trideceth Sulfate	16.53%
	TEA-C12-13 Pareth-3 Sulfate	18.72%
	Lauramidopropylamine Oxide	3.58%
5	Cocamide MEA	3.84%
	Disodium EDTA	0.05%
	Glycereth-4	0.36%
	Oleth-9	0.45%
	Propoxytetramethyl Piperidiny1 Dimethicone	2.25%
10	Fragrance	q.s.
	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

15

EXAMPLE 9

	Ammonium Dodecylbenzenesulfonate	12.58%
	Potassium Dodecylbenzenesulfonate	18.72%
	Isosteareth-4	0.74%
20	Trideceth 7	1.26%
	Propoxytetramethyl Piperidiny1 Dimethicone	4.20%
	Cocamidopropylamine Oxide	4.56%
	Cocamide MEA	3.84%
	Disodium EDTA	0.05%
25	Fragrance	q.s.
	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

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EXAMPLE 10

	Sodium Cocoamphohydroxypropylsulfonate	19.21%
	Ammonium Lauryl Sulfosuccinate,	18.72%
	Cocamide MEA	3.84%
5	Myristamide MEA	2.89%
	Trideceth 4	1.40%
	C14-15 Pareth-6	2.10%
	Propoxytetramethyl Piperidiny1 Dimethicone	7.10%
	Disodium EDTA	0.05%
10	Fragrance	q.s.
	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

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EXAMPLE 11

	Potassium Laureth-5 Carboxylate,	22.58%
	Disodium Lauramido MEA-Sulfosuccinate	18.02%
	Myristamide MEA	3.47%
20	Cocamide MEA	3.84%
	Trideceth 3	1.20%
	Trideceth 6	1.50%
	Propoxytetramethyl Piperidiny1 Dimethicone	8.00%
	Disodium EDTA	0.05%
25	Fragrance	q.s.
	Preservatives	q.s.
	Sodium Chloride	1.70%
	Color	q.s.
	Water	to 100%

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While this invention has been described with respect to various specific examples and embodiments, it is to be understood that the invention is not

limited thereto and that it can be variously practiced with the scope of the following claims.

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